

CLAIMS

What is claimed is:

1. A pharmaceutical composition comprising:
a divalent metal or metal oxide; and
a compound comprising at least one thiol group,
or a pharmaceutically acceptable salt, solvate or prodrug thereof, wherein said divalent metal and said at least one thiol group form a metal:thiol complex, in association with a pharmaceutically acceptable carrier, excipient or diluent.
2. The pharmaceutical composition of claim 1, wherein said divalent metal or metal oxide is selected from the group consisting of Ba^{2+} , Be^{2+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Cu^{2+} , Fe^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Pd^{2+} , Pt^{2+} , Sn^{2+} , Sr^{2+} , VO^{2+} , and Zn^{2+} .
3. The pharmaceutical composition of claim 1, wherein said compound comprising at least one thiol group comprises a cyclic or acyclic carbon framework wherein said cyclic or acyclic carbon framework comprises electron-donating or electron-withdrawing groups.
4. The pharmaceutical composition of claim 3, wherein said cyclic or acyclic carbon framework is aliphatic, heterocyclic, aromatic, or heteroaromatic, and said cyclic or acyclic carbon framework comprises single, double or triple bonds.
5. The pharmaceutical composition of claim 1, wherein said compound is an optical isomer, enantiomer, diastereomer, racemate or stereochemical mixture thereof.
6. The pharmaceutical composition of claim 1, wherein said compound comprising at least one thiol group is selected from the group consisting of dithiothreitol, dithioerythritol, 1,4-dihydroxy-2,3-dimercaptobutane, 1,2-ethanedithiol, 3,4-dimercaptotoluene, trithiocyanuric acid, 2,5-dimercapto-1,3,4-thiadiazole, 2,3-dimercapto-1-propanol, 2-mercapto-3-butanol, β -mercaptoethanol, 2-mercaptoethylamine, 1-monothioglycerol, 2,3-

butanedithiol, 1,4-butanedithiol, 1,2-propanedithiol, 1,3-propanedithiol, benzene-1,2-dithiol, 1,2-benzenedimethanedithiol, 2,3-dimercaptopyridine, 3,4-dimercaptopyridine, 4-mercaptopyridine, 3-mercaptopyridine, 2-mercaptopyridine, 2-mercaptoethylsulfide, 2-mercaptoethyl ether, bis-(2-mercaptoethyl)amine, mercaptoacetic acid, thiosalicylic acid, 2-mercaptopyridine-*N*-oxide and dimethyldithiocarbamic acid.

7. The pharmaceutical composition of claim 1, wherein the divalent metal to compound comprising at least one thiol group ratio is at least 1:1.
8. The pharmaceutical composition of claim 1, wherein the divalent metal to compound comprising at least one thiol group ratio is between 1:1 and 2:1.
9. A method for inhibiting a rho transcription termination factor, wherein the method comprises administering a chelating agent and a compound comprising at least one thiol group.
10. The method according to claim 9, wherein said chelating agent is a divalent metal or metal oxide.
11. The method according to claim 10, wherein said divalent metal or metal oxide is selected from the group consisting of Ba^{2+} , Be^{2+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Cu^{2+} , Fe^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Pd^{2+} , Pt^{2+} , Sn^{2+} , Sr^{2+} , VO^{2+} , and Zn^{2+} .
12. The method according to claim 9, wherein said compound comprising at least one thiol group comprises a cyclic or acyclic carbon framework wherein said cyclic or acyclic carbon framework comprises electron-donating or electron-withdrawing groups.
13. The method according to claim 12, wherein said cyclic or acyclic carbon framework is aliphatic, heterocyclic, aromatic, or heteroaromatic, and said cyclic or acyclic carbon framework comprises single, double or triple bonds.

14. The method according to claim 9, wherein said compound comprising at least one thiol group is selected from the group consisting of dithiothreitol, dithioerythritol, 1,4-dihydroxy-2,3-dimercaptobutane, 1,2-ethanedithiol, 3,4-dimercaptotoluene, trithiocyanuric acid, 2,5-dimercapto-1,3,4-thiadiazole, 2,3-dimercapto-1-propanol, 2-mercapto-3-butanol, β -mercaptoethanol, 2-mercaptoethylamine, 1-monothioglycerol, 2,3-butanedithiol, 1,4-butanedithiol, 1,2-propanedithiol, 1,3-propanedithiol, benzene-1,2-dithiol, 1,2-benzenedimethanedithiol, 2,3-dimercaptopyridine, 3,4-dimercaptopyridine, 4-mercaptopyridine, 3-mercaptopyridine, 2-mercaptopyridine, 2-mercaptoethylsulfide, 2-mercaptoethyl ether, bis-(2-mercaptoethyl)amine, mercaptoacetic acid, thiosalicylic acid, 2-mercaptopyridine-*N*-oxide and dimethyldithiocarbamic acid.
15. A method of treating bacteria comprising administering a therapeutically effective amount of a composition comprising a divalent metal or metal oxide and a compound comprising at least one thiol group.
16. The method according to claim 15, wherein said divalent metal or metal oxide is selected from the group consisting of Ba^{2+} , Be^{2+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Cu^{2+} , Fe^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Pd^{2+} , Pt^{2+} , Sn^{2+} , Sr^{2+} , VO^{2+} , and Zn^{2+} .
17. The method according to claim 15, wherein said compound comprising at least one thiol group comprises a cyclic or acyclic carbon framework wherein said cyclic or acyclic carbon framework comprises electron-donating or electron-withdrawing groups.
18. The method according to claim 15, wherein said cyclic or acyclic carbon framework is aliphatic, heterocyclic, aromatic, or heteroaromatic, and said cyclic or acyclic carbon framework comprises single, double or triple bonds.
19. The method according to claim 15, wherein said compound comprising at least one thiol group is selected from the group consisting of dithiothreitol, dithioerythritol, 1,4-dihydroxy-2,3-dimercaptobutane, 1,2-ethanedithiol, 3,4-dimercaptotoluene, trithiocyanuric acid, 2,5-dimercapto-1,3,4-thiadiazole, 2,3-

dimercapto-1-propanol, 2-mercapto-3-butanol, β -mercaptoethanol, 2-mercaptoethylamine, 1-monothioglycerol, 2,3-butanedithiol, 1,4-butanedithiol, 1,2-propanedithiol, 1,3-propanedithiol, benzene-1,2-dithiol, 1,2-benzenedimethanedithiol, 2,3-dimercaptopyridine, 3,4-dimercaptopyridine, 4-mercaptopyridine, 3-mercaptopyridine, 2-mercaptopyridine, 2-mercaptoethylsulfide, 2-mercaptoethyl ether, bis-(2-mercaptoethyl)amine, mercaptoacetic acid, thiosalicylic acid, 2-mercaptopyridine-*N*-oxide and dimethyldithiocarbamic acid.

20. The method according to claim 15, wherein said bacteria is gram-positive and/or gram-negative bacteria.
21. A method of treating fungi comprising administering a therapeutically effective amount of a composition comprising a divalent metal or metal oxide and a compound comprising at least one thiol group.
22. The method according to claim 21, wherein said divalent metal or metal oxide is selected from the group consisting of Ba^{2+} , Be^{2+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Cu^{2+} , Fe^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Pd^{2+} , Pt^{2+} , Sn^{2+} , Sr^{2+} , VO^{2+} , and Zn^{2+} .
23. The method according to claim 21, wherein said compound comprising at least one thiol group comprises a cyclic or acyclic carbon framework wherein said cyclic or acyclic carbon framework comprises electron-donating or electron-withdrawing groups.
24. The method according to claim 21, wherein said cyclic or acyclic carbon framework is aliphatic, heterocyclic, aromatic, or heteroaromatic, and said cyclic or acyclic carbon framework comprises single, double or triple bonds.
25. The method according to claim 21, wherein said compound comprising at least one thiol group is selected from the group consisting of dithiothreitol, dithioerythritol, 1,4-dihydroxy-2,3-dimercaptobutane, 1,2-ethanedithiol, 3,4-dimercaptotoluene, trithiocyanuric acid, 2,5-dimercapto-1,3,4-thiadiazole, 2,3-dimercapto-1-propanol, 2-mercapto-3-butanol, β -mercaptoethanol, 2-

mercaptoethylamine, 1-monothioglycerol, 2,3-butanedithiol, 1,4-butanedithiol, 1,2-propanedithiol, 1,3-propanedithiol, benzene-1,2-dithiol, 1,2-benzenedimethanedithiol, 2,3-dimercaptopyridine, 3,4-dimercaptopyridine, 4-mercaptopyridine, 3-mercaptopyridine, 2-mercaptopyridine, 2-mercaptoethylsulfide, 2-mercaptoethyl ether, bis-(2-mercaptoethyl)amine, mercaptoacetic acid, thiosalicylic acid, 2-mercaptopyridine-*N*-oxide and dimethyldithiocarbamic acid.

26. A method of treating a microorganism comprising administering a therapeutically effective amount of a composition comprising a divalent metal or metal oxide and a compound comprising at least one thiol group.
27. The method according to claim 26, wherein said microorganism is selected from the group consisting of fungi, parasites, bacteria and viruses.
28. The method according to claim 26, wherein said divalent metal or metal oxide is selected from the group consisting of Ba^{2+} , Be^{2+} , Ca^{2+} , Cd^{2+} , Co^{2+} , Cu^{2+} , Fe^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Pd^{2+} , Pt^{2+} , Sn^{2+} , Sr^{2+} , VO^{2+} , and Zn^{2+} .
29. The method according to claim 26, wherein said compound comprising at least one thiol group comprises a cyclic or acyclic carbon framework wherein said cyclic or acyclic carbon framework comprises electron-donating or electron-withdrawing groups.
30. The method according to claim 26, wherein said cyclic or acyclic carbon framework is aliphatic, heterocyclic, aromatic, or heteroaromatic, and said cyclic or acyclic carbon framework comprises single, double or triple bonds.
31. The method according to claim 26, wherein said compound comprising at least one thiol group is selected from the group consisting of dithiothreitol, dithioerythritol, 1,4-dihydroxy-2,3-dimercaptobutane, 1,2-ethanedithiol, 3,4-dimercaptotoluene, trithiocyanuric acid, 2,5-dimercapto-1,3,4-thiadiazole, 2,3-dimercapto-1-propanol, 2-mercapto-3-butanol, β -mercaptoethanol, 2-mercaptoethylamine, 1-monothioglycerol, 2,3-butanedithiol, 1,4-butanedithiol,

1,2-propanedithiol, 1,3-propanedithiol, benzene-1,2-dithiol, 1,2-benzenedimethanedithiol, 2,3-dimercaptopyridine, 3,4-dimercaptopyridine, 4-mercaptopyridine, 3-mercaptopyridine, 2-mercaptopyridine, 2-mercaptoethylsulfide, 2-mercaptoethyl ether, bis-(2-mercaptoethyl)amine, mercaptoacetic acid, thiosalicylic acid, 2-mercaptopyridine-*N*-oxide and dimethyldithiocarbamic acid.

32. A pharmaceutical composition comprising:

a divalent metal selected from the group consisting of Cd^{2+} , Ni^{2+} and Zn^{2+} ; and
a compound comprising at least one thiol group wherein said compound is selected from the group consisting of dithiothreitol, dithioerythritol and 2,3-dimercapto-1-propanol.

33. The pharmaceutical composition of claim 32, wherein the metal to compound ratio is between 1:1 and 4:1.

34. The pharmaceutical composition of claim 32, wherein the composition is in liquid, semi-solid or solid form.